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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/640,754	08/18/2000	In Sung Kim	SEC.747	7644

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Jones Volentile LLC  
12200 Sunrise Valley Drive  
Suite 150  
Reston, VA 20191

EXAMINER

LEE, HSIEN MING

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/640,754

Applicant(s)

KIM ET AL.

Examiner

Hsien-Ming Lee

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 2-10, 14, 15 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 2-7, 9, 10, 14, 15 and 21-23 is/are allowed.
- 6) ☒ Claim(s) 8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. The Final rejection as set forth in the previous Office action is withdrawn.
2. Claims 2-10, 14, 15 and 21-23 are pending in the application.

#### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Teo (US 5,895,264) in view of Jain (US 5,821,168).

Teo in Figures 1-4 and related text expressly and inherently teaches the claimed method of fabricating a semiconductor device, comprising:

- forming a conductive region 11 at the top of a semiconductor substrate 10 (Fig. 1);
- forming a first interlayer dielectric layer 12 on the semiconductor substrate 10 over the entirety of the conductive region 11 (Fig. 1);
- forming a conductive line 13, which is to be connected to the conductive region 11, on the first interlayer dielectric layer 12 (Fig. 1);
- forming a second interlayer dielectric layer 14/16 on the conductive line 13 (Fig. 1);
- removing portions of the first interlayer dielectric layer 12, conductive line 13, and second interlayer dielectric layer 14/16 which overlie the conductive region 11 to form a contact hole 18 which exposes the conductive region 11 (Fig. 3); and

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- filling the contact hole 18 with a conductive material 19 to connect the conductive line 13 to the conductive region 11 (Fig.4).

Teo further teaches that the conductive line 13 is formed by patterning (col.3, lines 5-6) but does not expressly teach that the conductive line is formed by forming a dielectric film pattern defining a line-shaped opening on the first interlayer dielectric and depositing conductive material in the line-shaped opening.

However, Jain, in an analogous art, teaches utilizing a damascene process for forming a dielectric film pattern defining a line-shaped opening (i.e. the opening formed in the dielectric film 30, Fig.2) on the first interlayer dielectric 36 and depositing conductive material in the line-shaped opening for forming the conductive line 28.

Therefore, it would have been obvious to one of the ordinary skill in the art, at the time the invention was made, to utilize the damascene process as taught by Jain for forming the conductive line of Teo since by doing so it would satisfactory form the conductive line at selective region.

***Allowable Subject Matter***

5. Claims 2-7, 9, 10, 14, 15 and 21-23 are allowed.
6. The following is a statement of reasons for the indication of allowable subject matter:  
The closet prior art of record, Teo to US 5,895,264, teaches a method of fabricating semiconductor devices, comprising:
  - forming a conductive region 11 at the top of a semiconductor substrate 10 (Fig.1);
  - forming a first interlayer dielectric layer 12 on the semiconductor substrate 10 over the entirety of the conductive region 11 (Fi.g1);

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- forming a conductive line 13, which is to be connected to the conductive region 11, on the first interlayer dielectric layer 12, the conductive line 13 having a gap therein of a predetermined width (Fig.1);
- forming a second interlayer dielectric layer 14 on the conductive line 13 such that a first portion of the second interlayer dielectric layer 14 occupies the gap in the conductive line 13 (Fig.1);
- removing a portion of the first interlayer dielectric layer 12 overlying the conductive region 11, the first portion of the second interlayer dielectric layer 14 and a second portion of the second interlayer dielectric layer 14 to form a contact hole 18 (Fig.3); and
- filling the contact hole 18 with a conductive material 19 to connect the conductive line 13 to the conductive region 11 (Fig.4).

In contrast, Teo neither teaches nor suggests removing the first portion of the second interlayer dielectric layer 14/16 *occupying the gap in the conductive line 13* and a second portion of the second interlayer dielectric layer 14/16 *overlying the gap* to form the contact hole 18, wherein the contact hole 18 is for filling the conductive material 19, which would connect the conductive line 13 and the conductive region 11; and the patterned photosensitive film defining *an opening therein having a width that is greater than* the width of the conductive line (claim 2).

### ***Conclusion***

7. Applicant's amendment filed 2/19/03 necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

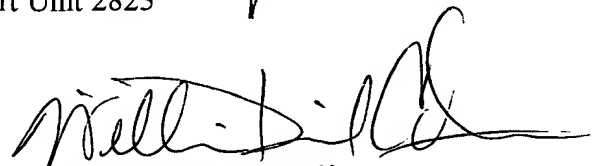
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsien-Ming Lee whose telephone number is 703-305-7341. The examiner can normally be reached on M-F (9:00 ~ 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Hsien-Ming Lee  
Examiner  
Art Unit 2823



**WILLIAM DAVID COLEMAN**  
Primary Examiner